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⑮考案の名称 室内除電器

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明細書

1 考案の名称

室内除電器

2 実用新案登録請求の範囲

1. 直流高電圧電源を内蔵したケースの外面の両端部に、該直流高電圧電源によってプラス・マイナスの直流高電圧をそれぞれ印加されるプラス電極とマイナス電極とをそれぞれ一対ずつ対設したことを特徴とする室内除電器。
2. 前記ケース内にファンを設け、該ケースの外面に、プラス電極とマイナス電極との中間において吹出口を設けたことを特徴とする請求項1記載の室内除電器。
3. プラス電極とマイナス電極との間に電流検出電極を設け、該電流検出電極の検出電流によって前記直流高電圧電源を制御するイオンバランス制御回路をケース内に設けたことを特徴とする請求項1または2記載の室内除電器。

3 考案の詳細な説明

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【産業上の利用分野】

本考案は、クリーンルームや一般の事務所等の天井などに設置し、直流高電圧印加によって室内の静電気を除電する室内除電器に関する。

【従来の技術】

従来、このような室内除電器として第6図に示すものがあった。この室内除電器は、横長のケースAに直流高電圧電源（図示せず）を内蔵し、該ケースAの下面の左右両端部のうちの一方にプラス電極針B、他方にマイナス電極針Cを突設し、これら電極針B、Cに直流高電圧電源からそれぞれプラス・マイナスの直流高電圧を印加して電極針B、C間にイオンを発生する。一般にこの室内除電器は、天井部からエアーを吹き出すクリーンルームの天井面Dに設置して使用されている。

【考案が解決しようとする課題】

しかし、この従来の室内除電器では、プラス電極針Bとマイナス電極針Cとの間では、プラス・マイナスのイオン量がほぼ同じ、つまりイオンバランスのとれた除電ができるが、これら電極針B、

Cの左右外方では、イオンアンバランスとなって逆に帯電現象が起こり、室内の空気または除電対象物体をプラス電極針B側ではプラス帶電、マイナス電極針C側ではマイナス帶電させてしまうことがあった。

本考案は、このような問題を簡素な構成で解決することを目的とする。

【課題を解決するための手段】

本考案による室内除電器は、直流高電圧電源を内蔵したケースの外面の両端部に、該直流高電圧電源によってプラス・マイナスの直流高電圧をそれぞれ印加されるプラス電極とマイナス電極とをそれぞれ一対ずつ対設したものである。

この室内除電器は、さらにケース内にファンを設け、該ケースの外面に、プラス電極とマイナス電極との中間において吹出口を設けることができる。

また、プラス電極とマイナス電極との間に電流検出電極を設け、該電流検出電極の検出電流によって直流高電圧電源を制御するイオンバランス制

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御回路をケース内に設けることができる。

【作　用】

このような室内除電器によれば、ケースの両端部のそれぞれにおいて、イオンを発生させることができるので、ケースの中間部ばかりでなく、両端部の外方においてもプラス・マイナスのイオンバランスを図ることができる。

また、ケースの両端部のそれぞれにおいて、プラス・マイナスの電極の間からエアーを吹き出すことにより、イオンを風とともに遠方へ送ることができる。

さらに、電流検出電極によってイオン電流を検出し、そのイオン電流値のプラス・マイナスの大小に従いプラス電極またはマイナス電極への印加電圧を調整すれば、イオンバランスの一層の安定化が図れる。

【実　施　例】

以下、本考案の一実施例を図面に基づき詳細に説明する。

第1図は本考案による室内除電器の下面図、第

2図は正面図である。この室内除電器は、横長矩形のケース1を室内の天井部に吊り下げ、または取付金具で取り付けて使用する形態になっている。ケース1の下面2の左右両端部には、多數のスリット3を円形領域内に設けることにより左右の吹出口4が形成されている。また、その下面2には、プラス電極5とマイナス電極6とが左右それぞれ一対ずつ吹出口4の前後に配置して対向突設されている。これらプラス電極5とマイナス電極6とは、左右で前後の配置がプラス・マイナス逆になっている。さらに、左右の吹出口4の間の下面2には、左右それぞれのプラス電極5とマイナス電極6との間でしかも吹出口4の周縁近傍に、電流検出電極7がそれぞれ突設されている。

プラス電極5とマイナス電極6とは実質的に同じ構造で、第3図に示すようにケース1内に位置する円筒形の電極ホルダ8中に電極針9を挿入し、該電極針9の上端ネジ部9aを電極ホルダ8の上端部に螺着し、また電極ホルダ8の下端に、ケース1の外側から電極保護キャップ10を螺着し、ケ

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ース1の下面2から突出する電極針9の下端部を該電極保護キャップ10で包被したものである。

電流検出電極7は、第4図に示すように電極棒11を、プラス電極5及びマイナス電極6の場合と同様に、電極ホールダ8に螺着するとともに、該電極ホールダ8の下端に電極保護キャップ10を螺着したものであるが、電極棒11の下端部は電極保護キャップ10より下方へ突出している。

第5図はケース1内における電気接続構成の一部、つまり左右同構成であるためその一方についてだけ示す。プラス電極5（具体的にはその電極針9）には、プラス高電圧発生回路12から整流回路13及び電流制限用抵抗14を介して直流プラス高電圧が印加され、マイナス電極6には、マイナス高電圧発生回路15から整流回路16及び電流制限用抵抗17を介して直流マイナス高電圧が印加される。直流高電圧電源となるプラス高電圧発生回路12及びマイナス高電圧発生回路15は、一般の交流電源に接続された整流回路18からの直流電圧を供給され、それぞれプラス・マイナスの直流高電圧を発

生する。

電流検出電極7（具体的にはその電極棒11）は、プラス高電圧発生回路12及びマイナス高電圧発生回路15を制御するイオンバランス制御回路19に接続され、電流検出電極7で検出されたイオン電流のプラス側が多いときは、プラス高電圧発生回路12の出力電圧が下げられ、またマイナス側が多いときにはマイナス高電圧発生回路15の出力電圧が下げられ、ケース1の左右それぞれにおいて、プラス電極5とマイナス電極6との間でイオンバランスが図られる。電流検出電極7の検出電流が所定以上に上昇または下降すると、つまりプラス・マイナスのイオンアンバランスが所定以上になるとブザー20が鳴動し、さらにそれが進むとプラス高電圧発生回路12及びマイナス高電圧発生回路15が停止されるようになっている。なお、プラス高電圧発生回路12とマイナス高電圧発生回路15のうちの一方の出力電圧のみを加減し、他方は一定としても、イオンバランスは図れる。

ケース1内には、左右の吹出口4にそれぞれ対

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向してファン21が設けられている。該ファン21は交流電源によって駆動される。

この室内除電器は以上のような構成であるため、ケース1の左右端部のそれぞれにおいて、プラス・マイナスの電極5、6により直流コロナ放電が生じ、それによるイオンは左右それぞれ吹出口4から吹き出される風によって遠方へ送られる。従って、ケース1の左右端部の真下及びその間の下方は勿論のこと、ケース1の左右端の左右外方に對してもプラス・マイナスのイオンが等量に送られる。しかも、左右それぞれにおいて、電流検出電極7でイオン電流を検出し、そのプラス・マイナスの大小に応じてプラス高電圧発生回路12及びマイナス高電圧発生回路15の出力電圧を自動調整するため、イオンバランスを常時図れる。

【考案の効果】

本考案による室内除電器によれば、ケースの両端部のそれぞれにおいて、イオンを発生させることができるために、ケースの中間部ばかりでなく、両端部の外方においてもプラス・マイナスのイオ

ンバランスを図ることができる。

また、請求項2のように、ケースの両端部のそれぞれにおいて、プラス・マイナスの電極の間からエアーを吹き出し、イオンを風とともに遠方へ送れば、広範囲にわたり同条件で除電できる。

さらに、請求項3のように、電流検出電極によってイオン電流を検出し、そのイオン電流値のプラス・マイナスの大小に従いプラス電極またはマイナス電極への印加電圧を調整すれば、イオンバランスの一層の安定化が図れる。

4 図面の簡単な説明

第1図は本考案による室内除電器の下面図、第2図は同正面図、第3図はプラス・マイナスの電極の拡大断面図、第4図は電流検出電極の拡大断面図、第5図は電気接続構成の一部のブロック図、第6図は従来例の正面図である。

1 ……ケース、4 ……吹出口、5 ……プラス電極、6 ……マイナス電極、7 ……電流検出電極、
12 ……プラス高電圧発生回路、13 ……マイナス高

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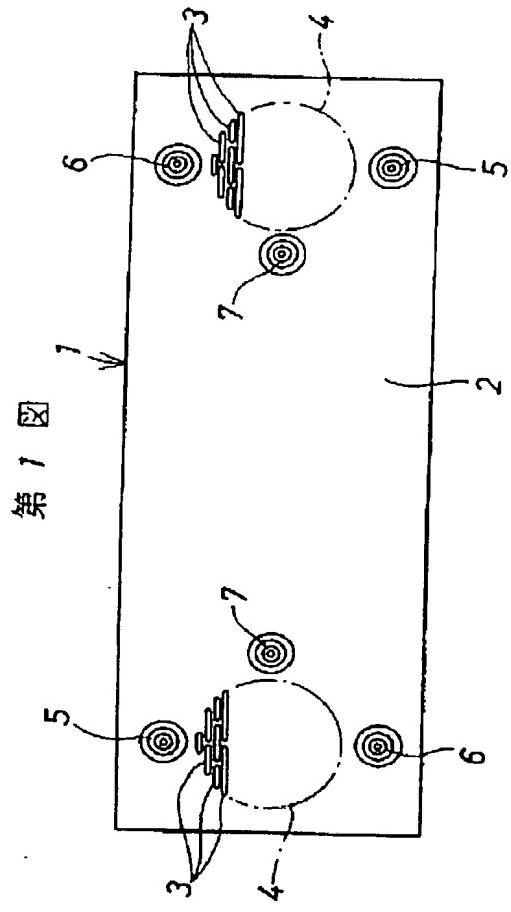


電圧発生回路、19……イオンバランス制御回路、
21……ファン。

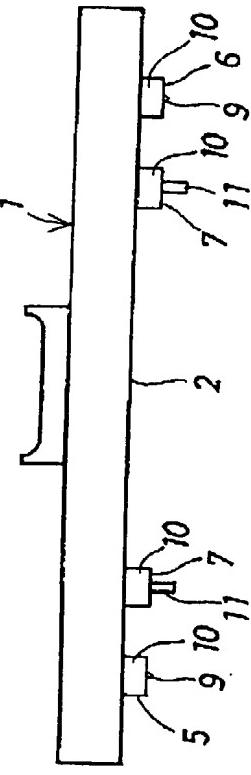
実用新案登録出願人 春日電機株式会社

代理人 弁理士 原田信市



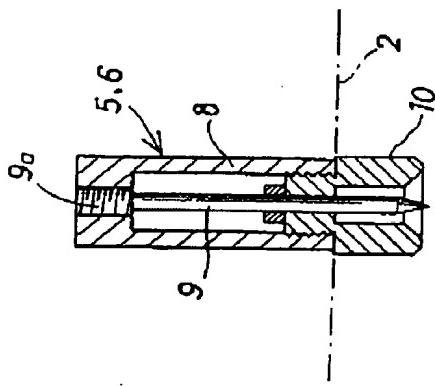


第2図

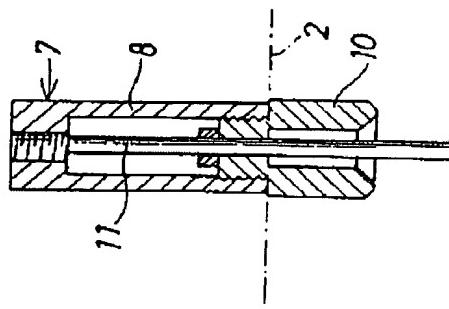


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代理人 特許原田信一
市

第3図

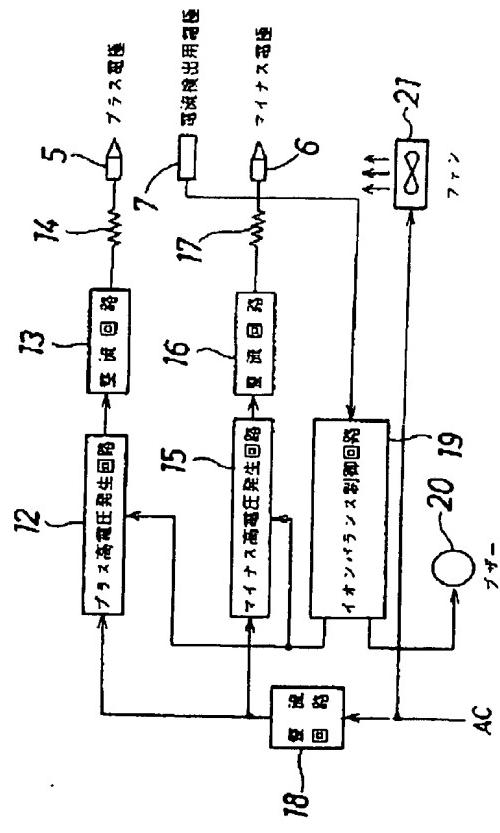


第4図

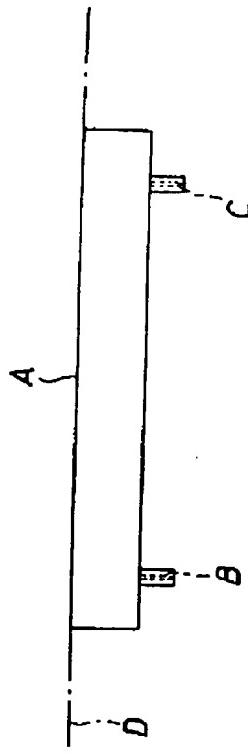


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CLAIMS**[Utility model registration claim]**

[Claim 1] The indoor electric discharge machine with which the plus electrode and minus electrode of each other to which the direct-current high tension of plus minus is impressed according to this direct-current high-tension power source, respectively are detached, respectively to the both ends of the outside surface of the case which contained the direct-current high-tension power source, and a couple every 2 group deer is also characterized by arranging so that these 2 sets of plus electrodes and minus electrodes may be located on the diagonal line.

[Claim 2] The indoor electric-discharge machine according to claim 1 characterized by to have prepared the current detection electrode between said plus electrodes and minus electrodes, and to prepare the ion balance control circuit which controls at least one side of the minus electrical potential difference impressed to the positive voltage and the minus electrode which are impressed to a plus electrode from said direct-current high-tension power source according to the detection current of this current detection electrode in said case in 2 sets of said each.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed explanation of a design]**[Industrial Application]**

This design is installed in head linings, such as a clean room and a general administration building, etc., and is related with the indoor electric discharge machine which discharges indoor static electricity by direct-current high-tension impression.

[Description of the Prior Art]

There were some which are conventionally shown in drawing 6 as such an indoor electric discharge machine. This indoor electric discharge machine contains a direct-current high-tension power source (not shown) in the oblong case A, one plus electrode needle B is protruded on one side of the right-and-left both ends of the underside of this case A, and it protrudes one minus electrode needle C on another side, impresses the direct-current high tension of plus minus to these electrode needle B-C from a direct-current high-tension power source, respectively, and generates ion between the electrode needles B.C. Generally it is used for the head-lining side D of the clean room blowing off for Ayr by this indoor electric discharge machine from the head-lining section, installing.

[The technical problem which a design will solve and to carry out]

however -- this conventional indoor electric discharge machine -- between the plus electrode needle B and the minus electrode needles C -- the amount of ion of plus minus -- almost -- the same -- that is, although electric discharge which maintained ion balance can be performed, in the method of the outside of right and left of these electrode needle B-C, it will become ion imbalance. That is, a way serves as a minus electrification region, an electrification phenomenon happens [way] to reverse in these plus electrification region and a minus electrification region in the way outside a plus electrification region and the minus electrode needle C, and minus electrification of indoor air or an indoor electric-discharge object object might carry out by the plus electrification and minus electrode needle C side outside a neutralization region and a plus electrode needle B between a plus electrode needle B and a minus electrode needle C at a plus electrode needle B side.

This design aims at solving such a problem with a simple configuration.

[Means for Solving the Problem]

These 2 sets of plus electrodes and minus electrodes arrange so that a couple every 2 group deer may also be located on the diagonal line by detaching mutually, respectively in the plus electrode and minus electrode to which the direct-current high tension of plus minus is impressed according to this direct-current high-tension power source, respectively to the both ends of the outside surface of the case in which the indoor electric discharge machine by this design contained the direct-current high-tension power source.

Moreover, in said 2 sets of each, a current detection electrode can be prepared between a plus electrode and a minus electrode, and the ion balance control circuit which controls at least one side of the minus electrical potential difference impressed to the positive voltage and the minus electrode which are impressed to a plus electrode from a direct-current high-tension power source according to the detection current of this current detection electrode can be prepared in a case.

[Function]

According to such an indoor electric discharge machine, in each of the both ends of a case, since ion can be generated, since a way can also be made into the neutralization region which maintained the ion balance of plus minus, it reaches far and wide and can perform effective electric discharge not only outside the parts intermedia of a case but outside both ends. And since plus minus is the diagonal line arrangement which becomes reverse, 2 sets of electrodes can discharge an electrode to an average, without causing the maldistribution of plus ion or an anion among them also as 2 sets.

Moreover, if the ion current is detected and the applied voltage to a plus electrode or a minus electrode is adjusted according to the size of plus minus of the ion current value with a current detection electrode, much more stabilization of ion balance can be attained.

[Example]

Hereafter, one example of this design is explained to a detail based on a drawing.

The bottom view of the indoor electric discharge machine according [drawing 1] to this design and drawing 2 are front views. This indoor electric discharge machine hangs the case 1 of an oblong rectangle in the indoor head-lining section, or has become the gestalt used with fixing metal, attaching. The outlet 4 on either side is formed in the right-and-left both ends of the underside 2 of a case 1 by forming many slits 3 in a circular field. moreover -- the underside 2 -- the plus electrode 5 and the minus electrode 6 -- each right and left -- the opposite protrusion is arranged and carried out before and behind the couple [every] outlet 4. Pluses and minus become diagonal line arrangement, and, as for these 2 sets of plus electrodes 5, and the minus electrode 6, arrangement [before and after] has become plus minus reverse by right and left. Furthermore, moreover, the current detection electrode 7 protrudes on the underside 2 between the outlets 4 on either side near the periphery of an outlet 4, respectively between the plus electrode 5 of each right and left, and the minus electrode 6.

The electrode needle 9 is inserted into the electrode holder 8 of the cylindrical shape which the plus electrode 5 and the minus electrode 6 are the same structures substantially, and is located in a case 1 as shown in drawing 3. Upper bed screw section 9a of this electrode needle 9 is screwed on the upper bed section of an electrode holder 8, and the electrode protective cap 10 is screwed on the soffit of an electrode holder 8 from the outside of a case 1, and the husk of the soffit section of the electrode needle 9 which projects from the underside 2 of a case 1 is carried out with this electrode protective cap 10.

Although the electrode protective cap 10 is screwed on the soffit of this electrode holder 8 while the current detection electrode 7 screws an electrode 11 on an electrode holder 8 like the case of the plus electrode 5 and the minus electrode 6, as shown in drawing 4, the soffit section of an electrode 11 projects more below than the electrode protective cap 10.

Since drawing 5 is a part of electrical connection configuration within a case 1, i.e., the right-and-left said configuration, it shows only one of these. Direct-current plus high tension is impressed to the plus electrode 5 (specifically the electrode needle 9) through a rectifier circuit 13 and the resistance 14 for current limiting from the plus high-tension generating circuit 12, and direct-current minus high tension is impressed to the minus electrode 6 through a rectifier circuit 16 and the resistance 17 for current limiting from the minus high-tension generating circuit 15. The direct current voltage from the rectifier circuit 18 connected to general AC power supply is supplied to the plus high-tension generating circuit 12 and the minus high-tension generating circuit 15 used as a direct-current high-tension power source, and they generate the direct-current high tension of plus minus, respectively.

The current detection electrode 7 (specifically the electrode 11) When there are many plus sides of the ion current which was connected to the ion balance control circuit 19 which controls the plus high-tension generating circuit 12 and the minus high-tension generating circuit 15, and was detected with the current detection electrode 7 The output voltage of the plus high-tension generating circuit 12 is lowered, and when there are many minus sides, the output voltage of the minus high-tension generating circuit 15 is lowered, and in each right and left of a case 1, ion balance is achieved between the plus electrode 5 and the minus electrode 6. If the detection current of the current detection electrode 7 goes up or descends more than predetermined (i.e.,

if the ion imbalance of plus minus becomes more than predetermined), a buzzer 20 will carry out singing, and if it progresses further, the plus high-tension generating circuit 12 and the minus high-tension generating circuit 15 will be stopped. In addition, only one output voltage of the plus high-tension generating circuit 12 and the minus high-tension generating circuits 15 is adjusted, and ion balance can be achieved also as another side being fixed.

In the case 1, the outlet 4 on either side is countered, respectively, and the fan 21 is formed. This fan 21 drives by AC power supply.

the ion since this indoor electric discharge machine is the above configurations, the left right end section of a case 1 boils it, respectively, and set it, and direct-current corona discharge arises with the electrode 5-6 of plus minus, and according to it -- each right and left -- it is sent to a distant place by the wind which blows off from an outlet 4. Therefore, the ion of plus minus is ana sent also to the method of the outside of right and left at the right end of [left] a case 1 not to mention the lower part of just under the left right end section of a case 1, and the meantime. And in each right and left, since the current detection electrode 7 detects the ion current and it carries out regulating automatically of the output voltage of the plus high-tension generating circuit 12 and the minus high-tension generating circuit 15 according to the size of the plus minus, ion balance can always be aimed at.

[Effect of the Device]

According to the indoor electric discharge machine by this design, in each of the both ends of a case, since ion can be generated, since a way can also be made into the neutralization region which maintained the ion balance of plus minus, it reaches far and wide and can perform effective electric discharge not only outside the pars intermedia of a case but outside both ends. And since plus minus is the diagonal line arrangement which becomes reverse, 2 sets of electrodes can discharge an electrode to an average, without causing the maldistribution of plus ion or an anion among them also as 2 sets.

Moreover, if the ion current is detected and the applied voltage to a plus electrode or a minus electrode is adjusted like claim 2 according to the size of plus minus of the ion current value with a current detection electrode, much more stabilization of ion balance can be attained.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

For this front view and drawing 3 , the expanded sectional view of the electrode of plus minus and drawing 4 are [the bottom view of the indoor electric discharge machine according / drawing 1 / to this design, and drawing 2 / some block diagrams of an electrical connection configuration and drawing 6 of the expanded sectional view of a current detection electrode and drawing 5] front views of the conventional example.

1 [.. A minus electrode, 7 / .. A current detection electrode, 12 / .. A plus high-tension generating circuit, 13 / .. A minus high-tension generating circuit, 19 / .. An ion balance control circuit, 21 / .. Fan.] A case, 4 .. An outlet, 5 .. A plus electrode, 6

[Translation done.]

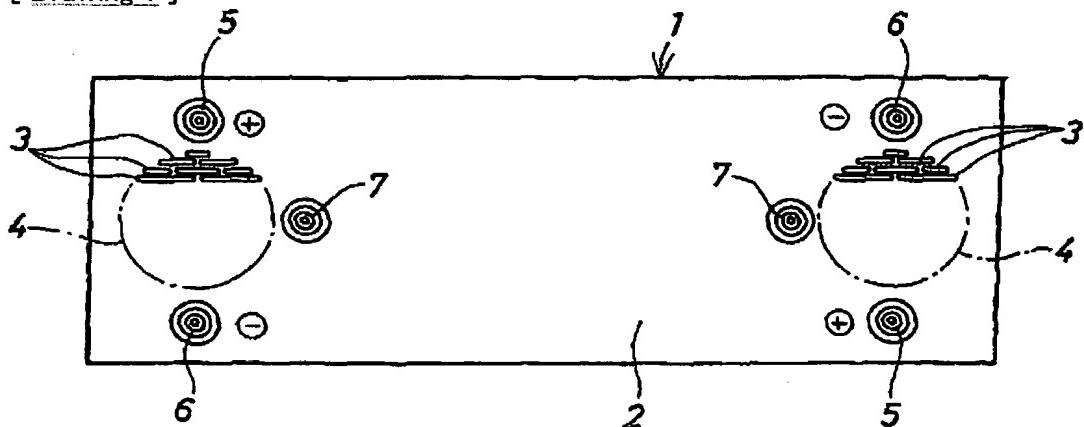
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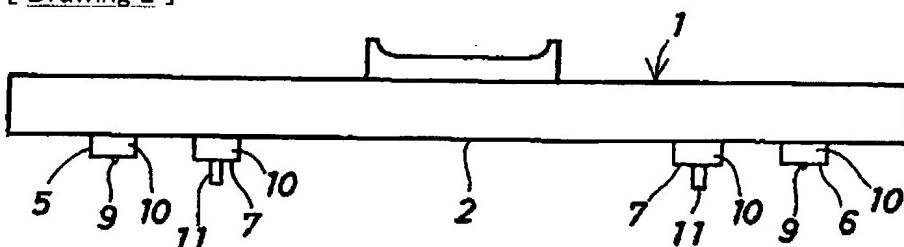
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. *** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

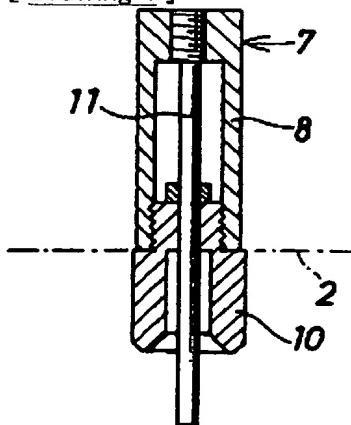
[Drawing 1]



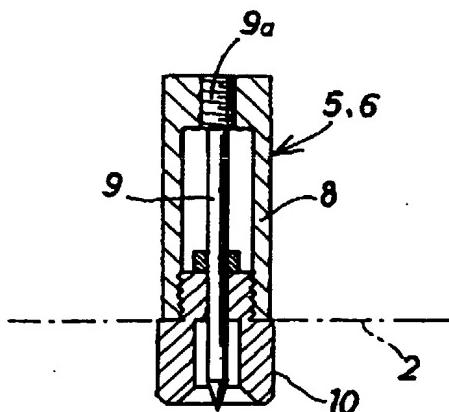
[Drawing 2]



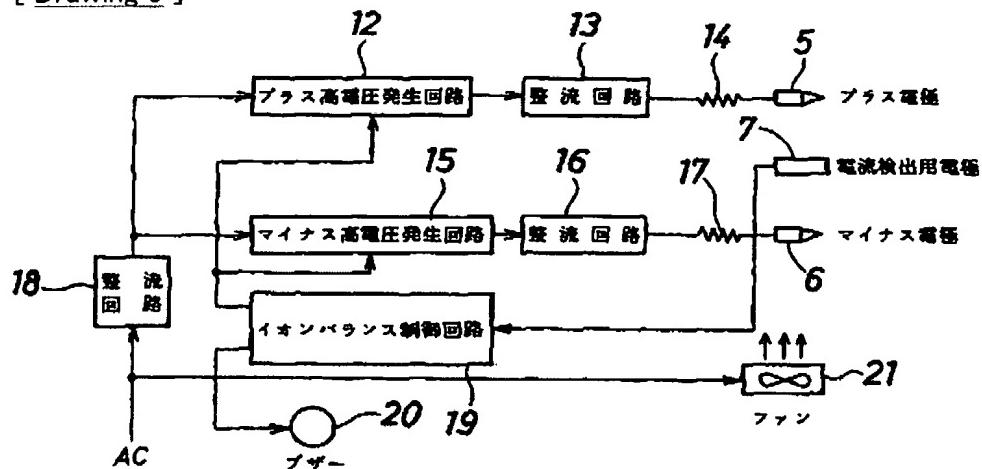
[Drawing 4]



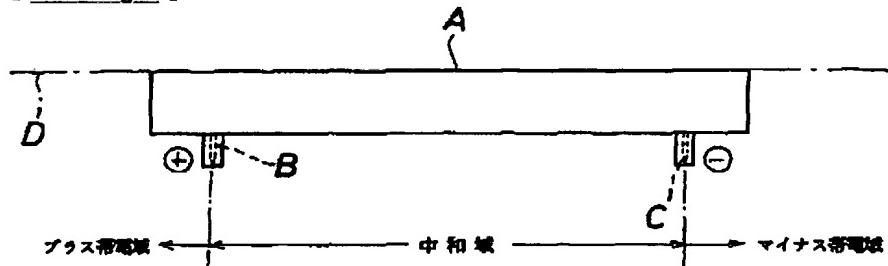
[Drawing 3]



[Drawing 5]



[Drawing 6]



[Translation done.]

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